

COAL MINING

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ANN ARBOR, MICH

November, 1957

Volume 34, No. 11



Star performers at successful mines!

Profitable coal stripping depends almost entirely upon the proper use of good equipment. For that reason, leading mine operators depend on Lima 2400s . . . sold, serviced and guaranteed by Highway.

Among the quality features of Limas are air operated clutches that assure complete ease of handling, anti-friction bearings at all bearing points and torque converter that automatically adjusts speed to load requirements.

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Highway

**HIGHWAY
EQUIPMENT
COMPANY**

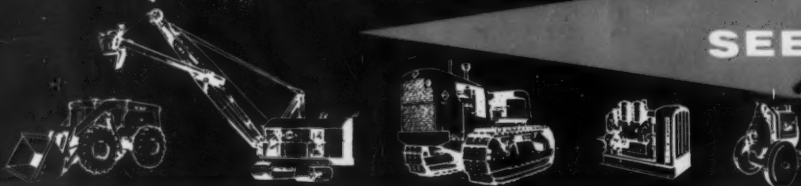
6465 Hamilton Ave. • Pittsburgh 6, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master
General Motors Diesel Engines • Power-Pack Conveyors
Gar Wood • Lima Roadpackers • Burmeister Mixers and Bins
Michigan Tractor Shovels and Excavator-Cranes
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Pilgrim Coal Co. boosts production with Michigan Tractor Shovels from *Highway*



2 Michigan 175As work as a team to speed coal handling.



Tractor-Shovel loads coal into Lippmann Crusher. The latter is another of the fine equipment lines sold, serviced, guaranteed by Highway.



Here's well over 3 cubic yards in this bucket.

• Busiest...fastest equipment at Pilgrim Coal Co., Volant, are 2 Model 175A Michigan Tractor Shovels.

• These all-wheel drive, rubber-tired units have 3 cubic yard bucket capacity...133 h.p....24,100 lbs. of balanced weight that makes "child's play" of the toughest digging. Ask your Highway representative today for full profit facts about this most efficient, modern equipment.

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Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master General Motors Diesel Engines • Power-Pack Conveyors Gar Wood • Lima Roadpackers • Burmeister Mixers and Bins Michigan Tractor Shovels and Excavator-Cranes

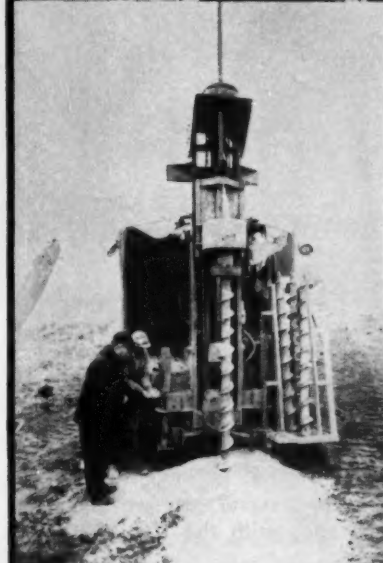
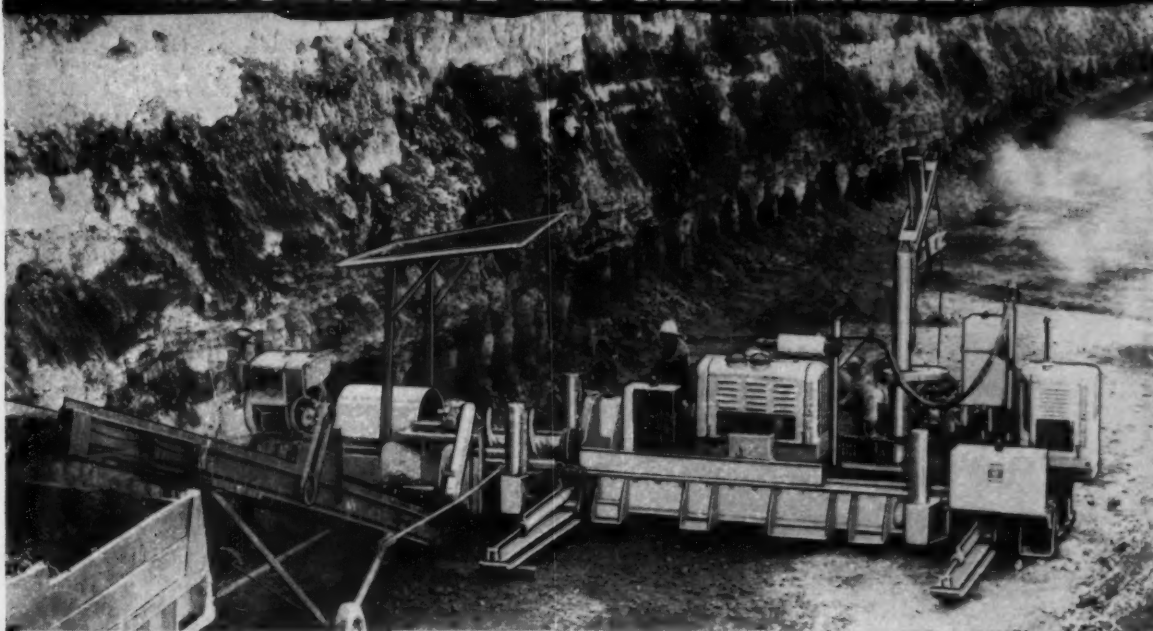
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CUT MINING COSTS

WITH **HEAVY - RUGGED - POWERFUL**

McCARTHY AUGER DRILLS



VERTICAL

MODEL 106-24

World's Fastest Heavy-Duty Vertical Auger Drill

Bores faster, deeper, larger dia. holes than any other auger drill. New gear reduction unit slows auger rotation for operation in hard rock formations. Drills 8" and 9" dia. holes readily in shale and sandstone formations, drills larger dia. holes up to 24" dia. in softer formations.

Write for Bulletin M-100

FINGER-TIP CONTROL



Gives Desired Rotating Speed Of Auger

HYDRAULIC FEED



Provides Any Speed Up To 6 Feet Per Minute Horizontal Feed Of Drill

COAL RECOVERY

"Walks" from hole to hole to auger high-quality Bonus Coal

An Ohio miner removes 450 tons of coal in each 6 1/2-hour working day with this Model 14 36-42 x 12' McCarthy drill, operated by two men. He drills 42" dia. holes 144' deep. Auxiliary conveyor eliminates spillage at hole. It operates on either side of drill for working blind cut. Twelve different models of McCarthy Coal Recovery Drills mine low-cost "bonus coal."

Write for Bulletin M-101 and M-102



HORIZONTAL MODEL 104

Lowest Drilling Costs per foot, Self-Propelled or Truck-Mounted

Bores up to 12" dia. holes to 150' depth faster, cheaper than any other horizontal drill. Requires less working space, saves many man-hours. . . operates easily in tight, hard-to-reach locations.

Write for Bulletin M-105

THE SALEM TOOL CO.

SOUTH ELLSWORTH AVENUE

SALEM, OHIO. U. S. A.



ECONOMY OF OPERATION AND INCREASED PRODUCTION

CAN BE
Yours



The four Barnosky Brothers — Joe, Paul, Louis and Albert — bought their Cat D9 in December of 1956, based on their satisfactory experience with Caterpillar D8 and D7 Tractors. They expected good service from the D9 but were pleasantly surprised to find it equalling the production of two Cat D8's, the long-recognized standard of comparison in coal stripping.

Increased production and economy of operation can be yours, too, with the new 320 flywheel H P D9, producing 98,000 lbs. of drawbar pull and with a 'dozer capacity of 12 cubic yards.

The big power, weight and traction of the D9 will prove its value on your operation. Don't take our word for it, ask the man who owns one! Or — better yet — call us about a demonstration right on your own strip job.

WITH A CAT® D9 FROM BECKWITH

Cat D9 tractor, equipped with No. 9S Bulldozer, is used to doze spoil material cast up by stripping shovel, in addition to stripping overburden at B & B mine located at Hackers Creek, West Virginia.



"OUR CATERPILLAR D9 IS DOING THE JOB OF 2 D8's"

"Our Caterpillar D9 is doing the job of two D8's. It is surpassing the expectations we had for it when we signed the purchase order. We are sold on "Cat" products. We get very good service from our dealer and find that standardizing on Cat gives us economy of operation and increased production through lack of down time."

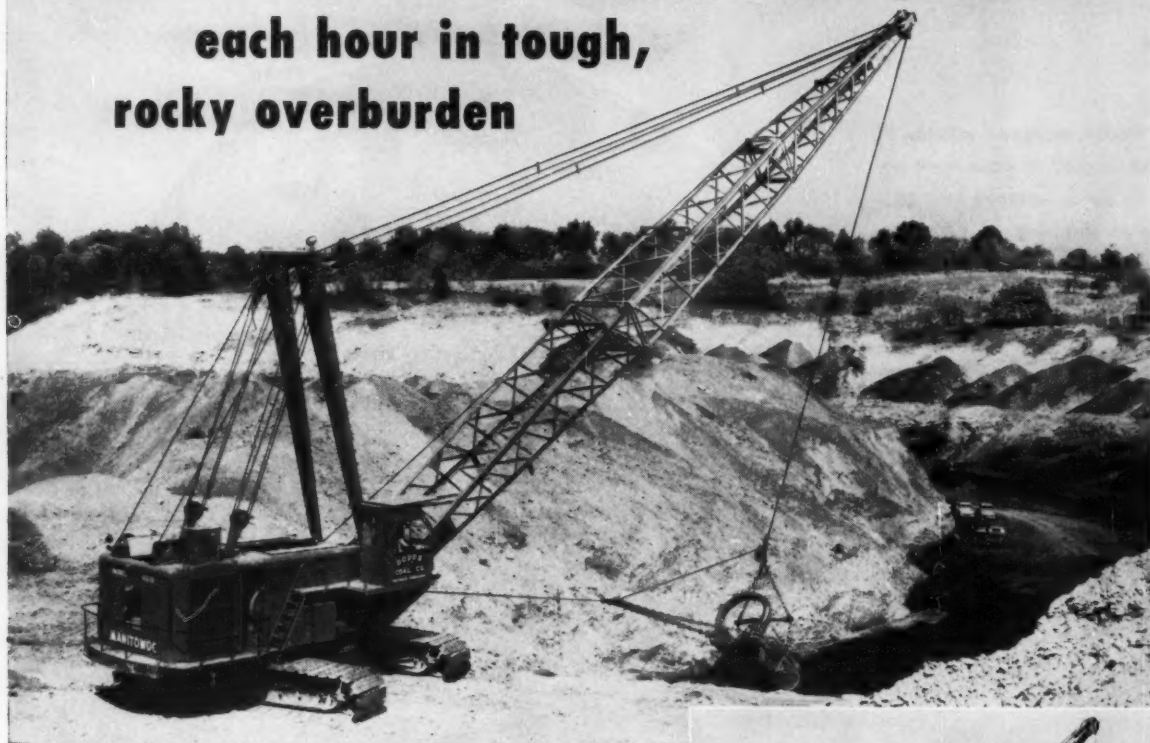
These are the statements of Mr. Joseph Barnosky, shown at left, partner in B & B Coal Company of Mount Clare, West Virginia. Mr. Paul Barnosky, another partner, is shown at right.

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MACHINERY CO.

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6550 Hamilton Avenue • PITTSBURGH • Phone: MONTROSE 1-6900

MANITOWOC 5½-yd. drag makes 80 passes each hour in tough, rocky overburden



Two 5½-yd. Maniotowoc Model 4500 draglines are opening new coal mining areas for the Dodds Coal Co., New Galilee, Pa. Both of the drags operate 20 hours at a stretch, with one unit averaging 80 passes per hour of hard-to-handle overburden. Approximately 8800 cu. yds. are moved each day by this machine, pictured above working a cut 100' wide and 70' deep and equipped with a 120' boom.

The Maniotowoc units have the capacity, flexibility and range to consistently produce big output at a profit for the Dodds Co. Since the Model 4500's have a single diesel power package they are not restricted by trailing electrical cables and the need to work close to power installations. Simple design — no complicated electrical motors, switches or miles of wiring — has kept the big draglines working constantly with little downtime for maintenance. All lubrication can be handled from the inside with the exception of the fairlead and seven fittings. And these are greased in minutes, usually during a shift change.

The Dodds Company's Maniotowocs were set up in only three days, compared to weeks of set-up time required by other rigs of this capacity. And on-the-job mobility is superior, too, with speed and ease of handling equal to a crawler tractor.

Repeat orders from every coal mining area are proof of Model 4500 performance. Ask your Maniotowoc distributor for complete literature and specifications.

MANITOWOC ENGINEERING CORP. MANITOWOC, WIS.

BASSLER EQUIPMENT CO.

Forty Fort, Pa.

ANDERSON EQUIPMENT CO.

Bridgeville, Pa.



REMOVING BOULDERS UP TO 15 TONS APIECE, a second Maniotowoc Model 4500 owned by the Dodds Coal Co. works a 200' wide cut. Skillful handling of the drag enables the huge boulders to be moved with comparative ease. The amount of blasting usually required for removing rough overburden like this is greatly reduced.

COAL MINING

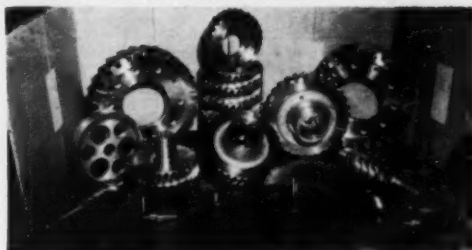
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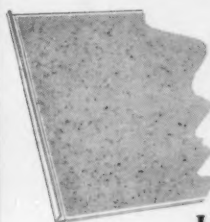


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"Euc" dependability maintains
production for Skyline Coal Co.



Powered by a 218 h.p. diesel driving through a five-speed transmission and the Euclid performance-proved planetary drive axle, the Model R-18 has a top speed of 27 mph with full payload.

In Evanston, Kentucky, the Skyline Coal Company is producing 2000 tons of coal daily from an abandoned strip mine. Secret of their achievement is the auger method of mining—and reliable hauling equipment!

The coal is loaded directly into the waiting Rear-Dump haulers . . . three Model R-18 Euclids. With a narrow pit, the easy maneuverability of the "Eucs" enables drivers to spot the Rear-Dumps under the loader without delay. The "Eucs" haul the coal 1¼ miles to a head-house where it is dumped and

stockpiled for the preparation plant. At Skyline, as on many other mining operations, Euclids have proved their dependability for low-cost production around the clock.

Whether they're hauling coal or overburden . . . on long or short hauls . . . "Eucs" move more loads at lower cost per ton. It will pay you to have your Euclid dealer give you facts and figures on the complete line of Euclid equipment. He'll be glad to show you why *Euclids are your best investment.*

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



Do You Know?

In this age of push-buttons and automation do not underestimate the abilities of the normal human being in controlling machines, receiving and processing information, and computing, whether in war or in everyday living.

Dr. Max W. Lund, head of engineering psychology for the Office of Naval Research, Washington, in a paper before the American Association for the Advancement of Science described man's sensory, computational or motor capacities, used in a partnership of man and machine.

Man's senses of seeing, hearing and touch make him a highly reliable receiver, Dr. Lund declared. Man can see color, brightness and form. The highest intensity at which the eye can function is about a hundred million times the lowest. The eye responds to as little as three or four quanta of energy. Under ideal conditions it can detect the presence of an object which subtends about a half second of visual angle, which is roughly equivalent to seeing a sixteenth-of-an-inch wire from a distance of a half mile.

Man's auditory response is so acute that it is only slightly greater than the energy released by the collision of air molecules in random Brownian movement. The loudest sound he hears, without pain, is roughly ten trillion times as much.

Man can receive communication code through tactual vibration more rapidly than he can receive auditory Morse code. His sensitivity ranges are limited, 20 to 20,000 cycles per second in the sound spectrum and from 4,000 to 7,000 Angstroms in the electromagnetic spectrum. He can receive an input of only ten successive items per second.

Today man is required to do certain jobs which nature never intended that he do, Dr. Lund observed, such as function on an aircraft carrier deck in noise of 140 to 150 decibels, and fly at altitudes and speed where his sensory equipment is not adequate.

Man is an exceptionally good evaluative computer. For instance, from radar he is able to estimate courses, velocities, times and points of interception with considerable accuracy. Man has good long-term memory for generalized experience but rather poor immediate memory for most sensory functions, especially in audition.

Man is a relatively poor numerical computer, especially under stress, but he is the only available computer which can solve problems by logical induction.

A human being can talk, push buttons, use handcranks and joy sticks. His output in highly developed skills, such as typing or playing the piano, appears limited to approximately 25 bits a second which is five or six letters or notes per second. Man can supply several hundred pounds of force with leg and back muscles for short periods of time. Man's work output is variously estimated at from one-tenth to a half horsepower for continuous operation to as much as one and a third horsepower for 20 seconds.

While human beings vary widely in capacities, body sizes, training and skills, Dr. Lund emphasized that the engineer should design equipment that can be used by anyone likely to use it.

HERE AND THERE IN THE COAL INDUSTRY



GEORGE H. SAMBROOK

• George H. Sambrook, director of mine inspection for U. S. Steel's Coal Division has been elected chairman of the Coal Mining Section of the National Safety Congress at the annual meeting of the Congress held in Chicago, October 21-25.

Mr. Sambrook began his business career with U. S. Steel in the Lynch, Ky. mines of U. S. Coal and Coke Company. While at Lynch he held numerous positions including general mine foreman and chief mine inspector. In January, 1941, Mr. Sambrook came to Pittsburgh as assistant safety director of H. C. Frick Coke Company, formerly a subsidiary of U. S. Steel, then safety director. In 1951 he was named director of mine inspection for the Coal Division the position he now holds.

Mr. Sambrook is a member of the Executive Committee of the Coal Mine Inspectors Institute and a member of the National Mine Rescue Association. For many years Mr. Sambrook has served on the U. S. Steel Safety Advisory committee.

• F. H. Morton of Charleston, W. Va., president of the Ames Mining Co., died after suffering a heart attack. Funeral services were held in Charleston, with interment at Rainelle, W. Va.

• Northern West Virginia Coal Association, at its annual meeting in Fairmont on October 22, re-elected James F. Trotter as president. Other officers are Vice presidents George R. Higinbotham, W. J. B. Mayo, and Stephen Canonico; and Secretary-Treasurer T. E. Johnson.

The following were elected directors: C. R. Næller, Frank R. Amos, George Judy, H. John Harper, Jay C. Jamison, Jr., R. J. Craig, Frank Williams, Sr., Brock Showalter, E. E. Criswell, Ward Christopher, H. W. Moore, J. J. B. Stoetzer, Paul Hornor, W. E. Edmonds, M. A. Williams, George D. Curtin and Henry Weatherholt.

• Navajo Reservation Coal Mine to open. A coal mining and electric power development lease has been approved by the Department of the Interior which gives to the Utah Construction Co. of San Francisco exclusive right to mine for coal and to develop thermal power facilities on the Navajo Reservation, south of Fruitland, N. M. The Company has a 10-year lease on the 24,000-acre tract, which is 25 miles long and two miles wide at its widest point. The tribe retains the right to use lease surface areas of the tract wherever no interference with mining operations will result.

• Sahara Coal Company announces Scholarship. Acting through the Illinois Mining Institute, Sahara Coal Co. Inc., of Chicago, has granted a scholarship in engineering at the University of Illinois. An announcement by Henry C. Woods, chairman of Sahara, said the recipient would be required to study coal mine engineering or mining engineering, and that first preference would be given to a son or relative of a Sahara employee, second choice going to a resident of Saline County, and third to a resident of Illinois.

How to Handle

EMPLOYEE GRIEVANCES

● JACK BEDFORD



Drilling Blast Holes at the Boron Coal Co. Lecontes Mills, Penna., this Mayhew drill has a 29 foot Keelly Bar and 42 foot heavy duty mast. It is driven by a 471 General Motors Diesel engine.

Management of a coal mine would be a great deal easier if there were no employee grievances. On the other hand, it might make the management job just a little boring, too. Every time an employee has some complaint or grievance, either voiced or concealed, there is a human relations problem that coal mine management must solve satisfactorily.

Even with a detailed procedure for handling grievances in the company, there are still a thousand and one little things that can and do happen around the mine or office to bring about a minor grievance not covered in the company policy or procedure. These seemingly "petty" complaints and employee grievances can fester into serious sore spots and cause more trouble in the harmonious operation of the coal mine.

Here is a method of handling employee grievances that take a lot of the grief out of grievances. It is easy to follow, easy to remember, and easy to apply. Here are the three simple steps of this formula for handling employee grievances:

1. Cry
2. Listen
3. Smile

1. CRY

When an employee of a coal mine has a grievance, it is a real personal problem with him. Regardless of how trivial it may seem to everyone else, the employee is most sincere about his grievance. It is his complaint and he wants action — immediate and personal action.

One way to get the employee's viewpoint on his problem is to

friend he will get down to the true cause of his grievance. This makes it easy to follow the second step of the grievance handling formula . . . LISTEN!

2. LISTEN

During a discussion of the grievance with the employee, it is possible to arrive at the "real" cause of the complaint, determine a solution for the employee's problem, and to develop a plan for presenting the

along with his supervisor — out into the open discussion.

This makes it possible to correct the cause — the foreman's or the employee's attitude. It will avoid having the same problem come up again in the plant if some definite action is taken to make the supervisor aware of this trouble.

Listening attentively encourages the plant employee to talk freely. When the worker does not go into detail, the listener can encourage him to give more facts. One way is to look at the employee registering the grievance with a questioning glance that silently says, "Yes, go on."

When the questioning pause does not get the worker to talk freely about his grievance, it is possible to use still another effective technique. This strategy smokes out the true reason for the complaint by asking the employee one question, "yes, and . . ."

3. SMILE

This is the crucial point in handling the employee's grievance. The employee feels that last he has found a real friend. He has talked out his problem while someone has listened. He is ready for some action.

By smiling, the listener makes the employee feel he has a sympathetic friend. He is ready to accept the decision. If the smile is sincere, the employee will be more willing to go along with the final verdict about the grievance.

Smiles are good strategy. Smiles are dangerous, too. A smile that is laughing up the sleeve at the employee will do more harm than good. A smile that looks like a pasted on grin will cause the employee to change his attitude about the grievance handling and to be more demanding.

Smiling is easy if the first two steps of this formula for handling the employee grievance have been done in a friendly, sincere manner. It will be reflection of the attitude of the representative for management and will leave the employee with a pleasant feeling toward the executive level of the coal mine.



sympathize with him — cry over his problem. This makes the employee feel that he has at last found a friend. (Lack of friendship, according to industrial psychologists, is one of the major hidden reasons for an employee's grievances.)

Employees with a grievance are not too sure of themselves. They tend to have a chip on their shoulder and will assume an antagonistic attitude at the slightest provocation. Approaching the employee's grievance with a sympathetic ear will ease the tension.

Then, too, an employee who has found a friendly ear will talk more freely. As the employee talks to a

solution. All it requires to handle this step is to listen . . . listen attentively.

As the employee with the grievance talks, he will elaborate on each point. This will give good clues to the "real" cause of the employee's grievance. With all of the facts of the case out in the open, it may be possible to avoid a repeat of this same employee grievance.

For instance, the employee's grievance may be about his supervisor. He wants to change to some other work. When top management in the coal mine listen to the employee's complete story, it is possible to get down to the true cause — why the employee doesn't get

The Biennial Nationwide

SAFETY CONTEST



Champions in the combination Mine Rescue and First Aid competition, the Frick District Mine Rescue Team is congratulated on its outstanding performance by Jesse F. Core, general superintendent of this U. S. Steel Coal Division District. Shown with the trophies they won are: front row, (kneeling) John Brooks, instructor, and Tofil Myers. Back row, left to right, Charles Schuessler, Walter Vicinelly Marvin Gates, Peter Yadamic, captain, Mr. Core, Frank J. Shoaf, Jr., Richard Murphy and J. A. Boyle, chief mine inspector for the Frick District.

• The biennial nationwide First Aid and Mine Rescue Contest consisting of 49 teams, was held in Louisville, Kentucky, October 2, 3 and 4. The Mine Rescue contest consisted of 7 teams.

Honors in the First Aid competitions were won by the team representing the Wyoming Mine of the Island Creek Coal Company, Holden, West Virginia. First prize in the Mine Rescue Contest was won by the team representing the United States Steel Corporation, Lynch, Kentucky. First honors in the combination First Aid and Mine Rescue, the toughest competition of all, was won by the team representing the Robena Mine of the United States Steel Corporation, Uniontown, Pennsylvania.

Trophies for the first three places in mine rescue, first-aid, and combination were awarded by NCA, the United Mine Workers and Mine Safety Appliances Co. Congressional medallions also were awarded all first-place winners.



POWERED BY CATERPILLAR

the DIESEL ENGINE with a history of dependability

Why do you see so many more Caterpillar-built Tractors wherever dirt has to be moved fast and cheap? Why do you see so many more CAT* Motor Graders at work where the going is really tough? Why are so many shovels, cranes, power plants, compressors, crushers, pumps, rollers, loaders and mixers powered by Caterpillar Diesel Engines?

For part of the answer, look to the famous Cat-built Diesel Engine itself!

It was designed and built for the construction industry. It has an unequalled quarter-century history of dependability. It has been tried and proved in every major construction machine—on every job—in every climate—in every material.

This leadership has continued throughout the years. It is strengthened by the Caterpillar Dealer organization—by *your* dealer who specializes in meeting the needs of the construction industry.

Take full advantage of this partnership of machinery leadership and outstanding dealer organization by always specifying Cat.

For all the facts on Caterpillar-built equipment, parts and service, see your Caterpillar Dealer—today!

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.




A Quarter Century* of Diesel Experience

*The first production model diesel crawler tractor was built by Caterpillar in 1931. Since then, Caterpillar and Caterpillar Dealers have led in diesel power and the application of that power to the construction industry. First yesterday—today and tomorrow!

Engineering and design experience pays off for you in many ways. For more than a quarter century, research and engineering at Caterpillar have specialized in diesel engine development for the construction world. Today, contractors prefer Cat Diesel Engines because they are free from delicate checks and adjustments—operate economically, smoothly under a wide variety of loads. Tomorrow, you can be sure Caterpillar will continue to maintain the high standards of quality and leadership necessary to produce the most efficient power for the construction industry.

Your dealer has an important part in the Cat design-engineering team. It pays to have him on your profit team, too!

**FITTING
CAT DIESEL POWER
TO YOUR NEEDS**

**ENGINEERING MODERN DESIGN
AND DEPENDABILITY
INTO CAT DIESEL ENGINES**



Tomorrow ... continued power



**CAT DIESEL
QUALITY MANUFACTURING FOR
LONG LIFE — LOW MAINTENANCE**

Experience pays off when you see your Caterpillar Dealer about repowering or original power for your equipment. We have replacement power reports, blueprints and photographs of installations similar to yours. Our engineers will work closely with you to give you the power you need. We are in constant touch with equipment manufacturers and Caterpillar's engine specialists—whose facilities and experience are available to you. Let us handle your repowering job from original planning to the actual installation.

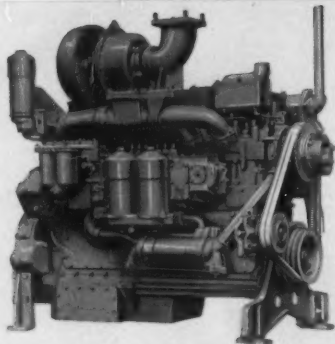


A quarter century of manufacturing experience pays off for you in terms of longer engine life, less maintenance. Today, Cat Diesel Engines are built in the world's most modern diesel factory, using the finest precision equipment. It is here that the long-life qualities of Caterpillar Engines are built in.

During manufacture, hundreds of inspections are made to safeguard *your* engine investment. After each engine is completely assembled, it is dynamometer-tested—carefully inspected and certified as to its horsepower capabilities.

For tomorrow, to keep abreast of the growing demand for Cat power, a larger and even more modern engine plant is being built—further proof of our efforts to deliver the best in construction power.

leadership . . . CATERPILLAR



12 BASIC ENGINES

... attachments to
meet your requirements

We can supply you with Caterpillar Diesel Engines up to 650 HP (Maximum Output Capacity) and Cat Self-Regulated Electric Sets up to 350 KW (Continuous Duty). Each is available with a complete matched set of attachments to meet your power needs. Engines available include both supercharged and naturally-aspirated types. Attachments include a variety of chain housings, stub shafts, torque converters, cooling systems and controls.

When you put your repowering jobs in our hands, we'll help you select the engine and matched equipment that will get maximum efficiency and production from your machine. Our factory-trained men will handle any part—or all—of your repowering job. You can depend on their recommendations and workmanship... just as you can depend on Caterpillar Diesel Engines for long life and economical operation.

Our business is built on service. A full line of parts and complete service facilities are at your command day or night—on your job, in our shop.

CATERPILLAR ENGINES BRIEF SPECIFICATIONS

Model	Horse-power	KW§	Bore & Stroke	No. Cylinders	Displacement
D397 (Series D) T	650†	350	5¾" x 8"	12	2493
D397 (Series D) RB	520‡	315	5¾" x 8"	12	2493
D397 (Series D) NA	415‡	250	5¾" x 8"	12	2493
D375 (Series D) T	430†	225	5¾" x 8"	8	1662
D375 (Series D) RB	350‡	200	5¾" x 8"	8	1662
D375 (Series D) NA	275†	160	5¾" x 8"	8	1662
D353 (Series C) T	390†	200	6¼" x 8"	6	1473
D342 NA	225†	100	5¾" x 8"	6	1246
D339 NA	140†	—	5¾" x 8"	4	831
D337 (Series F) T	310†	150	5½" x 6½"	6	805
D326 (Series F) NA	200†	100	5½" x 6½"	6	805
D318 (Series G) T	175†	75	4½" x 5½"	6	525
D318 (Series G) NA	119‡	60	4½" x 5½"	6	525
D318 NA	137†	60	4½" x 5½"	6	525
D315 (Series G) T	115†	50	4½" x 5½"	4	350
D315 (Series G) NA	82‡	40	4½" x 5½"	4	350
D315 NA	91.5†	40	4½" x 5½"	4	350
D311 NA	65†	30	4" x 5"	4	251

Code: † Maximum Output Capacity
‡ Intermittent
§ Continuous Duty

T — Turbocharged
RB — Roots blown
NA — Naturally aspirated

BECKWITH MACHINERY COMPANY

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HEADQUARTERS FOR MODERN **CATERPILLAR** DIESEL POWER

The Lima Model 604 Shovel Stripping Rock Overburden at the Bridgeview Coal Co.

New Late Model Stripping Equipment at the Bridgeview Coal Company

- New equipment predominates at the stripping operation of the Bridgeview Coal Company South of Uniontown, Pennsylvania. Recently purchased were a Manitowoc Model 3500 shovel and two new Caterpillar D-9 tractors. Also used for pushing overburden is a Caterpillar D-7 tractor. When not loading out stripped coal, a Lima Model 604 shovel is used for stripping in low overburden area.

The new Manitowoc Model 3500 shovel stripping Shale overburden at the Bridgeview Coal Co.



One of the two new Caterpillar D-9 tractors pushing overburden.

Huge

LIGNITE FIELD

Uncovered in India

• As part of India's drive from a static to dynamic economy earth-moving operations have recently begun to uncover one of the world's large fields of lignite, the soft brown substance intermediate between peat and coal.

Lignite fields here stretch over 100 square miles, in a thick layer about 180 feet below the ground level, according to T. M. S. Mani, managing director of the Neyveli Lignite Corporation (Private) Ltd. Geologists have estimated that 2,000 million tons lie buried here, with more easily workable deposits of 200 million tons occurring in an area of about five and one-half square miles.

Upon this smaller area in the South Arcot district, 135 miles south of Madras, India's Prime Minister Jawaharlal Nehru inaugurated the work as part of India's advancement "from a static economy to a dynamic, moving and self motivated economy."

First use of the lignite will be in a thermal plant to generate 200,000 kilowatts of power yearly for relief of the power-short areas of South India. This source of electricity will release valuable reservoir water for irrigating crops during the dry months of the Indian year.

A proposed 380,000 tons of carbonized briquettes manufactured yearly from the lignite will substitute for coal now transported over long distances from the north. The smokeless briquettes will also be welcomed by village housewives for cooking their rice and curry,

in place of valuable cow dung which could be turned back to enrich the fields. A third important use of lignite here will be in a fertilizer factory to produce urea.

The danger of floods from many high pressure artesian springs, a unique freak of nature that has prevented relatively easy conventional mining of the lignite, is a major problem of the project. Below the 55-foot thick layer of lignite the water exerts an upward thrust of about six to eight tons per square foot. Once the weight of the thick burden of tough sandstone and earth is removed from the top of the lignite, this pressure is lifted and water would heave upwards, bursting through the lignite seams to flood the mine.

Thus pressure must be kept continuously under control. A careful system of mechanized open cast mining has been worked out, with elaborate systems of large-scale pumping. Forty-eight thousand gallons of water per minute will have to be pumped out from 48 wells to maintain the pressure surface of the springs to safe level below the lignite. Only a relatively small section of lignite will be exposed and cut out at a time — a section about 6,000 feet long and 1,200 feet wide at the top, points out Mr. Mani. While huge earth-moving machines dig step-like terraces toward the lignite, other machines will cover up the areas already dug, thus releasing earth pressure from only a small area at a time.

Mining engineers estimate about

3.5 million tons of lignite will be removed in this way each year—the equivalent of about a million and a quarter tons of good coal. The lignite seam of the first cut is expected to be exposed in 1960, with full production reached the end of that year or in 1961.

Lignite is formed from vegetable matter in a manner similar yet midway between that which forms peat and coal. Millions of years ago lush plants flourished and then gradually decayed into a mass of rotten wood known today as peat. In some places, floods and movements of the earth's crust deposited soil and other matter on top of this rotting peat and stopped the bacterial action. Thus peat was consolidated and dehydrated into what we now call lignite. In other parts of the world soil pressure was further increased, and lignite was compressed further into coal.

Production of lignite throughout the world fluctuates widely from year to year. Statistics show that Germany is the largest producer of lignite, with large quantities being produced in Russia, Czechoslovakia and Hungary.

The Government of India has accorded a high degree of priority to the Neyveli project because of the acute shortage of fuel and power in South India. With this operation, which has received American and other nations' technical and economic aid, India hopes to speed up the development of industry and agriculture in the southern areas.



The descent in the pit cage down to the coal-face.



The mine has its own hospital where the miners and their families receive free medical care. Our photo shows the child of a miner who has just been admitted with pneumonia.



This is a miner from the Province of Bihar, India. He earns between 15 and 20 rupees a week (\$1, approx. 5 Rs.), and is given free lodging for himself and family and certain food rations: "juar," rice and corn.



The day's work done, our miner plays with his young son at home while his wife prepares the evening meal.



CHESTERFIELD OPENCAST COAL SITE

A Caterpillar D9 Tractor push-loading a new Caterpillar DW.21 Tractor with 470 Scraper, loading shale and heavy clay in subsoil removal operations at the National Coal Board's Watson opencast coal site, Chesterfield, England.

A Caterpillar DW 21 Tractor with 470 Scraper push-loaded by a Caterpillar D9 Tractor during sub-soil removal operations on a tip access road, at the National Coal Board's Watson opencast coal site, Chesterfield, England.



• "Make Mine Safety" is the title of a new 16mm sound-color motion picture just released by The Colorado Fuel & Iron Corporation. It is available for free loan to mines, schools, colleges and all groups interested in the mining industry.

"Make Mine Safety" entertainingly gives the facts about rock bolts—How and where they can be used to best advantage for maximum efficiency and safety. This motion picture is something new for the mining industry in that the story is entertainingly told by a mine foreman and mine engineer in a typical underground setting. The underground sequences were photographed in synchronous sound at Butte, Montana; Climax, Colorado and Rock Springs, Wyoming, so that all of the operations can be heard as well as seen.

Running time for the film is twenty minutes and it will be of interest everyone in the industry. Prints may be obtained for showing, without charge, by writing to the producer, Thos. J. Barbre Productions, 2130 South Bellaire Street, Denver 22, Colorado.

• An unusual bulletin, showing component parts of its new Hydrovane Rotary Compressors, is announced by Davey Compressor Co.

Among features stressed is accessibility for inspection or repair. This is said to be unmatched by any other rotary. Davey Compressors are also reputed to have 50% fewer working parts than other machines. Illustrations include cut-away photos taken from directly below the unit and sectional views of each side.

Oil separators, segmented rotor vanes, control panels and the engine speed control are among the components shown. For copies, write Davey Compressor Co., Kent, Ohio. Ask for E-268.



Caterpillar Diesel DW20 Tractor with on coal stripping operations. Athey PH20 rubber-tires trailer is used



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• Construction of a new 500,000 sq. ft. industrial engine plant for Caterpillar Tractor Co. began on August 14, when the Company's president, Harmon S. Eberhard, moved the first bulldozer blade full of earth on the plant's site, located 12 miles north of Peoria, Illinois. The engine plant will be the first of three facilities built in the 1100-acre area, with a multi-building research center and a general offices building slated for future construction. Also present to mark the beginning of work were H. H. Howard, vice president in charge of Caterpillar's Engine Division, and R. D. McDougal, Jr., president, McDougal-Hartman Co. of Peoria.

Preliminary work on the new plant will include site preparation by the McDougal-Hartmann Co. The Peoria firm will cut, fill and grade the site; excavate trenches for the installation of underground piping; install trunk line storm sewers and railroad track; and later will pave parking lots, driveways, storage areas and floors: The initial site preparation contract calls for the moving of 600,000 cu. yds. of earth by mid-September.

The new industrial engine plant will be completed by early 1959, and will be the source of manufacture for the Company's two largest engine models, the D397, having a 650 maximum horsepower rating, and the D375, a 430 maximum horsepower unit. In addition, the plant will be the assembly point for industrial engine arrangements of other engines in the Caterpillar line. Design and manufacture of all special industrial engine attachments will also be carried on in the new engine plant. Manufacture of the remainder of the Caterpillar Engine line will continue in the Company's Peoria plant.

Work on the three new facilities will be a major part of Caterpillar's current building program—the total cost of which is estimated at approximately \$200 million for the next three years. It is expected that over 3,500 people will be employed in the new area when all facilities are completed.



Caterpillar D9 Tractor equipped with No. 9S Bulldozer is backfilling and leveling material on land reclamation job after stripping coal for the Bookwalter Coal Co., Bells Landing, Pa.

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Hydraulic, Electric and Pneumatic Equipment

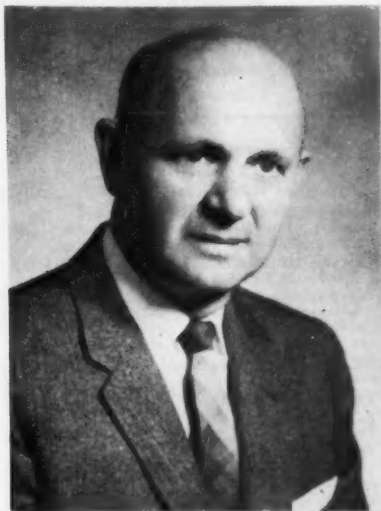
— REDUCE WEAR AND DOWN TIME... Install SCHROEDER LINE FILTERS —

• New production techniques offer full color promotional printing to small business men in limited runs. Brates Printing Office of Albany, New York, who have developed this method, claim that they can furnish high fidelity full color printing for little more, and in some cases less, than black and white printing!

Since color TV is making the public color conscious in product presentation, this process was developed by Brates to fill the need of small advertising budgets that must compete with full color promotions.

The company has made available samples to anyone requesting them from Brates Printing Office, Albany, New York.

• Election of Jeff C. Clay as vice-president of engineering of the Long Company, Oak Hill, W. Va., mining equipment manufacturer, has been announced by J. B. Long, president of the company.

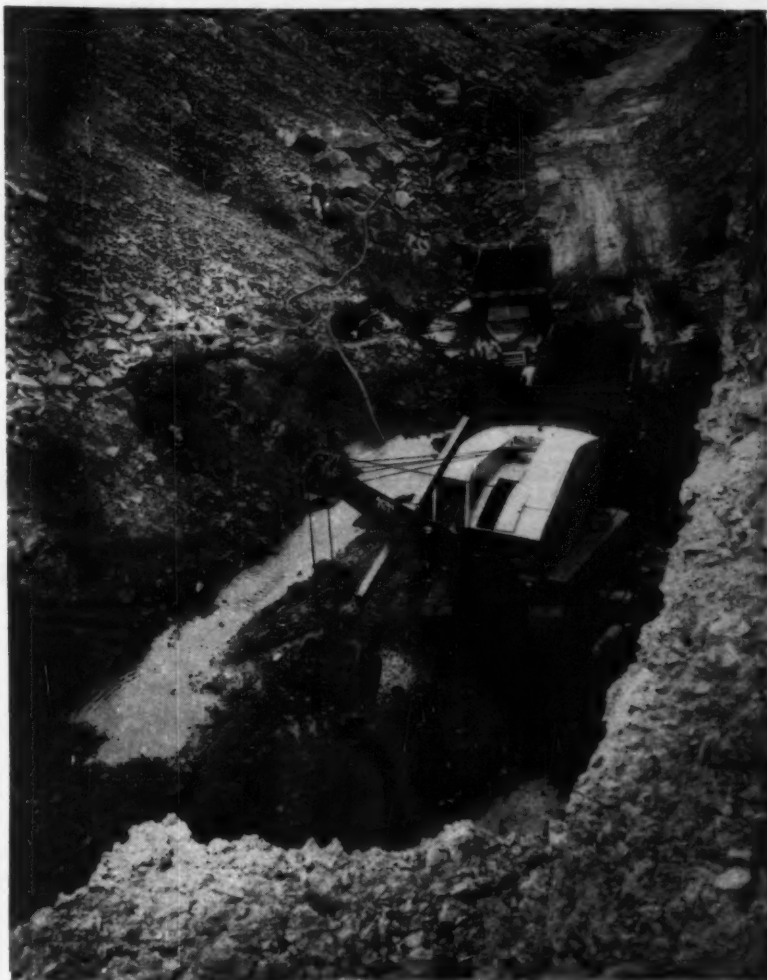


Jeff C. Clay

Prior to joining Long in 1954, Mr. Clay was chief draftsman with the Link-Belt Company. A native of Tennessee, he was graduated from Tri-State College, Angola, Indiana, in 1935 with a Bachelor of Science Degree in Mechanical Engineering. He has already assumed his new duties.



Caterpillar Diesel D318 Engine provides power for this Bucyrus-Erie shovel working on coal stripping operations of James E. Hoffman, near Karthaus, Pa.



Zackerl Coal Co., Oil City, Pa. Bucyrus-Erie 22B.

NOW at
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MACHINERY COMPANY

BUY

USED EQUIPMENT

ITEM 257-P544: Caterpillar D9 Tractor with Cat. No. 29 Cable Control and Cat 95 Blade. Here is your chance to the "Giant of the Bulldozers" (a real high production machine) at a low price. Installed new pins and bushings in track, new turbo-charger, new rings and one liner and reconditioned heads on engine. This machine is in "like-new" condition. Buy it at \$14,000 off the new price. F.O.B., Pittsburgh, Pa.

ITEM E227: International TD9 Tractor with Bucyrus-Erie Hydraulic Angledozer. This machine has been carefully checked over and is in good operating condition. A lot of good work life left in this machine at bargain price of \$4500. F.O.B., Erie, Pa.

ITEM WV225: Cietrac BDH Installed new track links, rebuilt Hydraulic Angledozer and Carco Model EA Winch. This is a versatile unit and in good condition. Diesel Tractor mounted with Heil spring. Invest \$4,700 in this machine and go to work. F.O.B., Clarksburg, W. Va.

ITEM P652: Cat D7 Tractor, equipped with Cat Control and an Angle Blade. Good working condition and can be put on your job for only \$2,800. F.O.B., Pittsburgh, Pa.

ITEM P660: Caterpillar Model D8 Tractor with straight Blade and rear double drum Cable Control unit. Repaired steering clutches and seals; replaced pinion and ring gear, dead shaft and sprocket left side; replaced seals and bearings and installed new sprocket on right side; tuned engine; adjusted master clutch; running gear in good condition. \$5,000.00. F.O.B., Pittsburgh, Pa.

ITEM P632: Caterpillar No. 11 Auto Patrol, Tandem Drive; Wt. 18,500 lbs.; 12 ft. Blade. Diesel engine recently reconditioned; tires are good, approximately 45% new; installed new shaft in tandem drive; adjusted operating clutches and brakes; steam cleaned and painted. \$2,500.00. F.O.B., Pittsburgh, Pa.

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CATERPILLAR MODEL D7, Serial No. 3T13495, with hydraulic angledozer. Rebuilt rollers. Installed new track. Warranty \$12,500

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Barber Green Belt Conveyor, 26 in. x 85 ft. and Drag Conveyor 30 in. x 25 ft.

Small Coal Mine, Metallurgical Coal, approx. 500 ton day—Pgh. Seam—deep mine—good location Pa.

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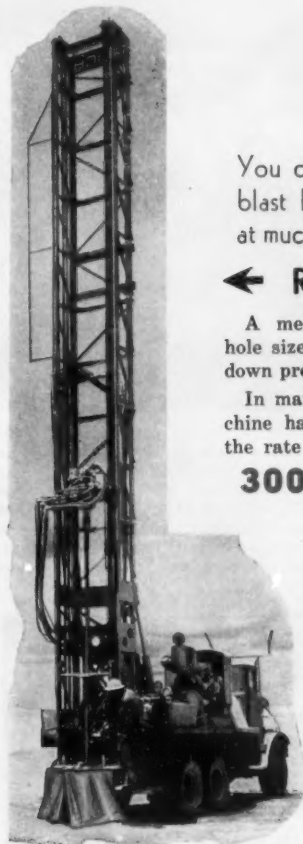
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Glad to give you a demonstration on your own work. Write, wire or phone —

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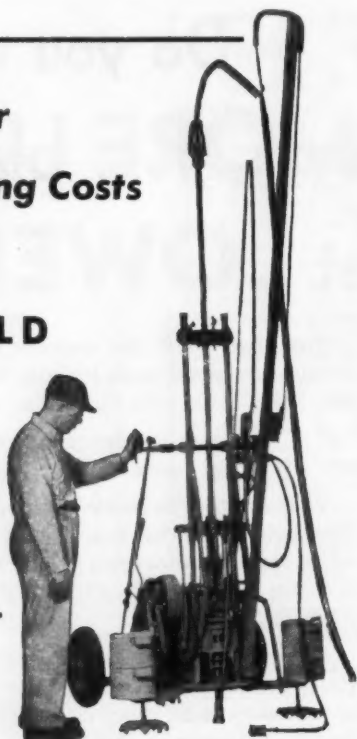
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A more efficient coal stripping operation is claimed by the Mays Coal Co., of Clarion, Pennsylvania, by having two Manitowoc units work as a team at the company's New Bethlehem Mine. Shown stripping overburden are a 6-yd. Manitowoc Model 4500 Dragline and a Manitowoc 2½ yd. Model 3500 High-Lift Shovel. The Mays Coal Co. uses two such Manitowoc teams which have resulted in fast, economical removal of overburden. The Model 3500 shovels are also used for loading coal into trucks.

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At Kristianson and Johnson Coal Co., Lansa, the powerful Allis-Chalmers HD-21 works in foreground. Behind it is a Lima 1201.

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